



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,278	01/22/2002	Shawn Peter Bawell	17797	6773
7590 10/08/2003 Tyco Technology Resources Suite 450 4550 New Linden Hill Road Wilmington, DE 19808-2952			EXAMINER TAKAOKA, DEAN O	
			ART UNIT 2817	PAPER NUMBER

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/055,278	BAWELL ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Dean O Takaoka	2817	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 July 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1,13,20 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-10,12,14 and 15 is/are rejected.
- 7) ☒ Claim(s) 11,16-19,21,23 and 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 18 July 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |                                                                                                              |                                                                             |
|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> . | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 5, 7 – 10, 12, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mourant et al. in view of Gorrie et al. (U.S. Patent No. 5,214,796).

#### Claim 2:

Gorrie et al. (best shown in Fig. 5) shows a quadrature hybrid circuit comprising well-known generic baluns but does not show specific spiral inductors.

Mourant et al. (Figs. 2A, 2AA, and 2B) shows a specific well-known art-recognized equivalent balun comprising the plurality of spiral inductors and an insulating layer disposed between the first and second spiral inductors (best illustrated in Fig. 2AA by the layer (un-labeled) shown between primary windings P and secondary windings S; col. 4, lines 46-52), where the first and second spiral layer are positioned relative to each other to create an intrinsic capacitance (where intrinsic or parasitic capacitances are shown as  $C_p$  in Fig. 2A).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the well-known generic baluns disclosed by Gorrie et al. with the specific well-known art-recognized equivalent balun comprising the

plurality of spiral inductors disclosed by Mourant et al. Such a modification would have been a mere substitution of well-known art-recognized equivalent baluns; further where Gorrie et al. teaches the use of spiral inductors, col. 7, lines 13-30, thus suggesting the obviousness of the substitution.

Claim 3:

Where the first and second spiral inductor are aligned (shown in Fig. 2A – Mourant et al.).

Claim 5:

Gorrie et al. (Figs. 2 and 3) teaches quadrature hybrid circuit where the couplers are contained on a MMIC (col. 1, line 45 to col. 2, line 7; col. 2, line 63 to col. 3, line 3).

Claim 7:

Where the overall length and width dimensions of the first and second spiral inductors are each approximately 200um x 200um (where Mourant et al. teaches 235um x 235um for 850MHz operation; col. 5, lines 29-40).

Claims 8 – 10:

Mourant et al. and Gorrie et al. teach the quadrature hybrid circuit comprising spaced spiral inductors comprising intrinsic capacitance, discussed in the reasons for rejection of claim 2 above, where Mourant et al. teaches where the area for the spiral length of the first and second spiral inductors example where the area for the spiral length of the first and second spiral inductors is 800um x 400um for a frequency of 900MHz and 235um x 235um for a frequency of 850MHz (col. 5, lines 29-40) but does not teach the equation for intrinsic capacitance of the claim.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the spacing between coupled inductors capacitance disclosed by Mourant et al. and Gorrie et al. with the formula for capacitance disclosed by the claim. Such a use of the well-known capacitance formula would have obvious in that the formula of the claim is a standard well-known formula for capacitance derived from any fundamental electronics book (e.g. exemplified by the formula 9.10 – Boylestad), further where Mourant et al. teaches the coupling  $k$  and mutual inductance  $M$  of the split layered spiral inductors, further teaching input and output impedances in which the coupling, mutual inductances, and intrinsic capacitances are resultant in the input and output impedances, further in which the area of the spiral lines for exemplary frequencies of 850MHz and 900MHz are further taught, thus suggesting the obviousness of the formula.

Claim 12:

Mourant et al. and Gorrie et al. teach the quadrature hybrid circuit comprising first and second spiral inductors, discussed in the reasons for rejection of claim 2 above, further comprising two quadrature hybrids (66, 80 – Fig. 5; Gorrie et al.); and a plurality of terminating elements (ground connections connected to 66, et al.).

Claim 14:

Where Mourant et al. and Gorrie et al. teach the quadrature hybrid circuit including comprising first and second spiral inductors, discussed in the reasons for rejection of claim 12 above.

Mourant et al. shows an example where the area for the spiral length of the first and second spiral inductors is 800um x 400um for a frequency of 900MHz and 235um x 235um for a frequency of 850MHz (col. 5, lines 29-40) but does not teach the size of the chip scale package is approximately 4mm x 6mm.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the area disclosed by Mourant et al. and Gorrie et al. with the area of 4mm x 6mm disclosed by the claim. Such a modification would have been obvious in that the dimensional area, e.g. electrical length of the inductors is dependent upon factors such as the desired frequency, pitch of the lines, and dielectric constant selected. Since the desired frequency is not provided in the claim/s, such as shown in the example given by Mourant et al. (for frequencies such as 900Mhz and 850Mhz), it would have been obvious to have modified the chip scale package of Mourant et al. and Gorrie et al. with an area of 4mm x 6mm to meet a desired frequency in a given application where the length and width of the spiral inductor lines are 4mm x 6mm thus suggesting the obviousness of the modification.

Claim 15:

Where the MMIC comprises a layer of GaAs (col. 3, lines 4-5; Gorrie et al.).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gorrie et al. and Mourant et al. as applied to claim 2 above, and further in view of Kusunoki (U.S. Patent No. 5,781,071).

Claim 6:

Gorrie et al. and Mourant et al. teach the quadrature hybrid circuit comprising a coupler with an insulating layer, discussed in the reasons for rejection of claim 2 above.

Mourant et al. teaches a well-known generic insulating layer but is silent where the insulating layer comprises Silicon Nitride.

Kusunoki (Fig. 6B) shows a similar multilayer device where an insulative layer (13) comprises a specific well-known art-recognized equivalent material such as Silicon Nitride (col. 5, lines 17-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the well-known generic insulating layer disclosed by Gorrie et al. and Mourant et al. with the specific well-known art-recognized equivalent material such as Silicon Nitride disclosed by Kusunoki. Such a modification would have been a mere substitution of well-known art-recognized equivalent insulative layer materials thus suggesting the obviousness of the substitution.

### ***Response to Arguments***

Applicant's arguments with respect to claims 2 – 12, 14, 19, 21, 23 and 24 have been considered but are moot in view of the new ground(s) of rejection.

With respect to Applicant's amendment dated July 18, 2003, all objections to the Specification, Drawings, and Claims contained in the previous office action dated April 15, 2003 are withdrawn.

### ***Allowable Subject Matter***

Claims 11, 16 – 19, 21, 23 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O Takaoka whose telephone number is (703) 305-6242. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (703) 308-4909. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.



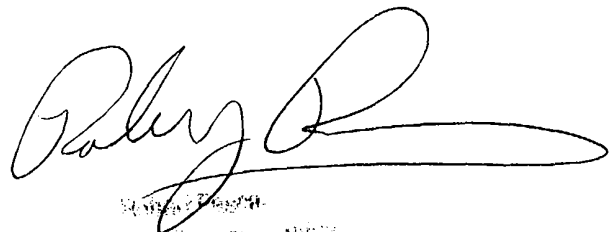
Application/Control Number: 10/055,278  
Art Unit: 2817

Page 8

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Dean O Takaoka  
Examiner  
Art Unit 2817

September 24, 2003



Stamp: RECEIVED  
SEP 24 2003  
ART UNIT 2817